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Journal of Community Medicine and Public Health Reports ISSN: 2692-9899

Research Article Volume 1 Issue 2

Average Mortality rate of Covid-19 in Iran

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Received date: 14 June 2020; **Accepted date:** 26 June 2020; **Published date:** 03 July 2020

Citation: Baber S (2020) Average Mortality Rate Of COVID-19 In Iran. J Comm Med Pub Health Rep 1(2): https://doi.org/10.38207/jcmphr100227

Abstract

Background: Corona virus disease was first reported in Wuhan City, Hubei province, China. Soon the corona virus disease has spread to many countries. World health organization has described the situation as Pandemic. By 12 March 2020, corona virus disease has affected 125 countries around the world. Corona virus was first confirmed in Iran on 19 February 2020.

Objective: The aim of writing this small article is to determine the mortality rate of corona virus disease in different cities of Iran. This article will give readers an idea of different ways to control spread of corona virus disease in Iran.

Methods: Author has collected the data of daily confirmed cases from different diagnostic centers and hospitals across the country from 19 February 2020 to 1 April 2020.

Results: Mortality rate of corona virus disease is roughly 4 %**.**

Conclusion: Mortality rate could rise if COVID 19 infection is not controlled.

Keywords: COVID 19, mortality, Iran, pandemic

Introduction

A case of pneumonia with unknown pathogen was first reported on 8 December in Wuhan City, Hubei province, China. On December 31, China confirmed around 27 cases of pneumonia with unknown pathogen to World health organization. Chinese scientists discovered the pathogen on 7 January and named as novel corona virus, Corona virus disease [COVID-19] **[1,2]**. World health organization on 30 January declared a 'public health emergency of international concern'. Soon the COVID-19 has spread to many countries. Honorable Director-General of WHO, Tedros Adhanom Ghebreyesus termed the situation as 'Pandemic' **[3]**. By 12 March 2020, COVID-19 has affected 125 countries around the world **[3,4]**. First two confirmed cases of Corona virus were emerged in Qom on 19 February 2020. Both cases were accurately detected before they died **[5]**. It was a shock to Iranian officials as none of them travelled abroad or out of Qom. It was extremely challenging for the Iranian administration to start testing of corona virus on suspected cases due to economic sanctions of the United States on direct access to test kits **[6]**.

Iran represents a country of about 83 million people. Initial findings suggest that a merchant may bring the virus from Wuhan to Qom. It is important to mention that both cases could have been sick weeks ago and infecting others for weeks **[7]**.

More infectious cases had been reported in major cities after Qom. After that, the Iranian government had begun taking practical measures. Subways, cars and BRT buses were disinfected. Schools, universities and cultural centers were closed. The Iranian health ministry had politely advised locals to carefully avoid crowdy areas and not shake hands. Citizens were also advised to limit the extensive use of bank notes. A lot of inmates in various prisons were released on a temporary basis. Short working hours were allowed in workplaces and public offices **[7,8]**.

Signs and symptoms of corona virus disease 19 [COVID 19]: It usually starts with mild fever, cough, profound fatigue, and mildpain in the body. A headache with or without moderate diarrhea or abdominal pain begins slowly. This can typically lead to respiratory distress in severe cases **[9]**.

Epidemiology and quarantine

Corona virus disease-19 [COVID- 19] infection typically spreads at a very fast pace and recently described as 'Pandemic' by world health organization. Quarantine is necessary for suspected patients. Quarantine is the reasonable restriction of movement of already infected or about to infect local people.

Suspected patients can quarantine in hospital. Mild cases with good immunity can self-quarantine at home.

Generally, the incubation period of corona virus is approximately 14 days. China reported a case of 27 days incubation period in world health organization. It can typically transmit through air via coughing or blood

contamination and faeces of infected persons. Mortality rate is higher in old age and patients with systemic diseases **[10,11]**.

There are several advantages of small cities.

First, it requires low cost and improved communication as compare to big cities. Second, due to low population, there is less consumption of masks, face shields and gowns. Third, low manpower or active personnel are required in smaller cities.

Methods to reduce spread of infection

Remember an important proverb 'Prevention is better than cure'.

1. Proper washing of hands with soap and water/hand sanitizer.
2. Maintaining clean and hygienic workplaces.
3. Handshake and kiss should be forbidden.
4. No excursions in Nowruz should be permitted.
5. No in restaurant food.
6. Meat well prepared.
7. Adequate use of herbs and in particular fruits, to improve immunity.
8. Periodic exercise.
9. Avoid touching nose, mouth, and eyes. Remember T sign of face.
10. Quarantine areas where contamination is high.
11. Educate through electronic media.
12. No unprotective interaction with wildlife.
13. No close contact with individuals having cold or flu like symptoms.
14. Infected persons should stay at home.
15. Complete isolation of COVID 19 patients.
16. Infected individuals should wear face masks to keep the infection away from other people. **[3,10-12]**.

Materials and methods

Data collection: There are numerous ways to collect the data of COVID 19 patients.

1. Household transmission data: We can ask the family members via telephone about symptoms of COVID 19. This method is unreliable. The family members can be false negative due to absence of symptoms or false positive like misdiagnosing with seasonal flu.
2. Questionnaire via mobile application software: These surveys are cost wise cheap and fast but again this method is not reliable.
3. Data collected from ministry of health: This ministry usually collects data from hospitals and laboratories electronically.

According to author, the standard method is hospital based or a laboratory-based data.

Not a single method can tell us the pinpoint accuracy of mortality rate of COVID- 19. Some patients might be in the incubation period. Ordinary villagers might consider this as an ordinary pneumonia due to lack of education and old customs and traditions. COVID-19 cases may be missed due to lack of diagnostic kits. Rapid testing Polymerase chain reaction [RT PCT] was used to confirm COVID -19 in suspected cases.

Author has obtained data of daily series of confirmed cases from different diagnostic centers and hospitals across the country from 19 February 2020 to 1 April 2020.Iranian ministry of health and medical education confirmed 47593 cases and 3036 deaths and 3871 critical cases till 1 April in Iran.

It is important to mention that no disparity of number of cases was found between the Iranian ministry of health and medical education and different diagnostic centers and hospitals.

Results

There are 47,593 cases reported so far in Iran with 3,036 deaths and about 3,871 in intensive care unit till 1 April 2020. Author believes that mortality rate of COVID -19 is roughly 4 % mostly elderly people i.e. approx. 88 % and young people with existing systemic diseases and poor immune system (10 %). Around 2 % of child deaths between age 12 to 14 years have been reported. It is important to mention that about 15,473 people have been recovered from infection. Detailed numbers of COVID 19 infections from 1 March to 1 April 2020 is summarized in the form of **Tables 1-3.**

Table 1: Detailed numbers of COVID 19 infections of month March from 1 to 12

Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Total number of infected persons	978	1501	2336	2922	3513	4747	5823	6566	7161	8042	9000	10075
Infected persons in past 24 hours	394	523	835	586	591	1234	1076	743	595	881	958	1075
Total number of deceased persons	54	66	77	92	107	124	145	194	237	291	354	429
Deceased persons in past 24 hours	11	12	11	15	15	17	21	49	43	51	63	75

Total number of recovered persons	0	0	0	0	0	913	1669	2134	2394	2731	2959	3276
Recovered persons in past 24 hours	0	0	0	0	0	913	753	465	260	337	228	317

Table 2: Detailed numbers of COVID 19 infections of month March from 13th day to 24 day.

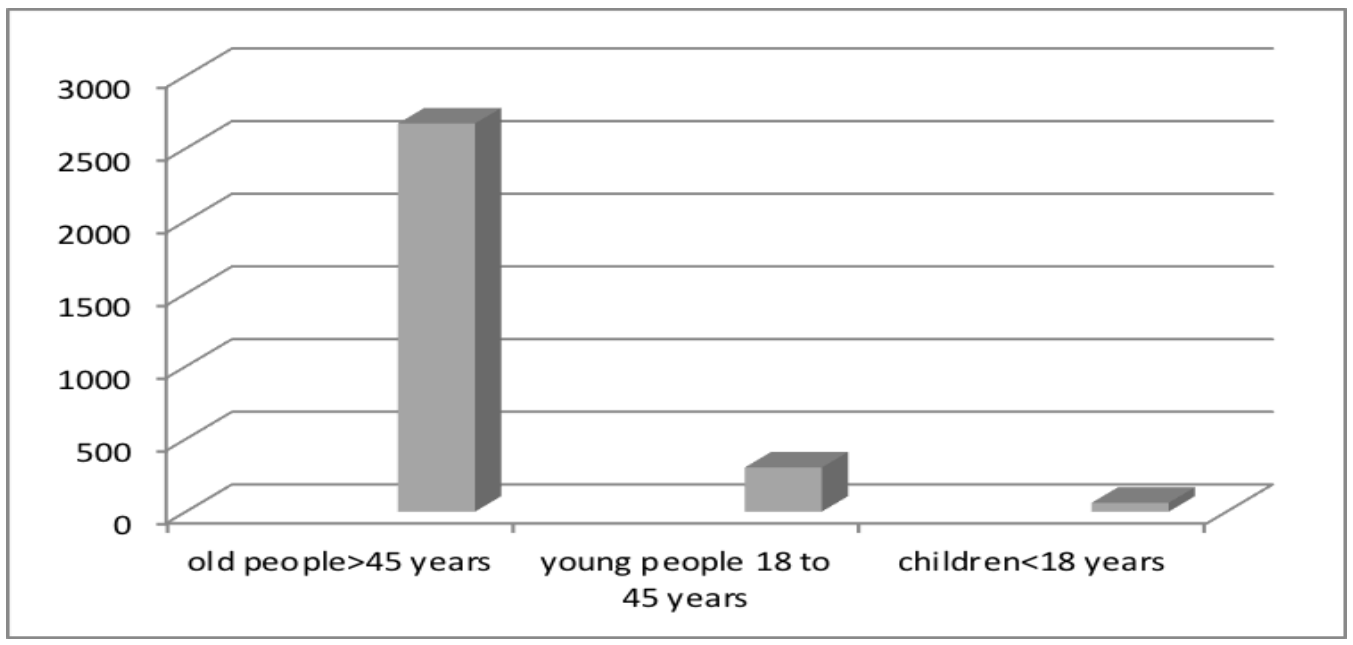
Day	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Total number of infected persons	11364	12729	13938	14991	16169	17361	18407	19644	20610	21638	23049	24811
Infected persons in past 24 hours	1289	1365	1209	1053	1178	1192	1046	1237	966	1027	1411	1762
Total number of deceased persons	514	611	724	853	988	1135	1284	1433	1556	1685	1812	1934
Deceased persons in past 24 hours	85	97	113	129	125	147	149	149	123	129	127	122
Total number of recovered persons	3529	4339	4590	4996	5389	5710	5979	6745	7635	7913	8376	8913
Recovered persons in past 24 hours	253	810	251	406	393	321	269	766	890	278	463	537

Table 3: Detailed numbers of COVID 19 infections of March from 25th to April 1st in Iran.

Day	25	26	27	28	29	30	31	1
Total number of infected persons	27017	29406	32332	35408	38309	41495	44606	47593
Infected persons in past 24 hours	2206	2389	2926	3076	2901	3186	3111	2988
Total number of deceased persons	2077	2234	2378	2517	2640	2757	2898	3036
Deceased persons in past 24 hours	143	157	144	139	123	117	141	138
Total number of recovered persons	9625	10457	11133	11679	12391	13911	14656	15473
Recovered persons in past 24 hours	712	832	676	546	712	1520	745	817

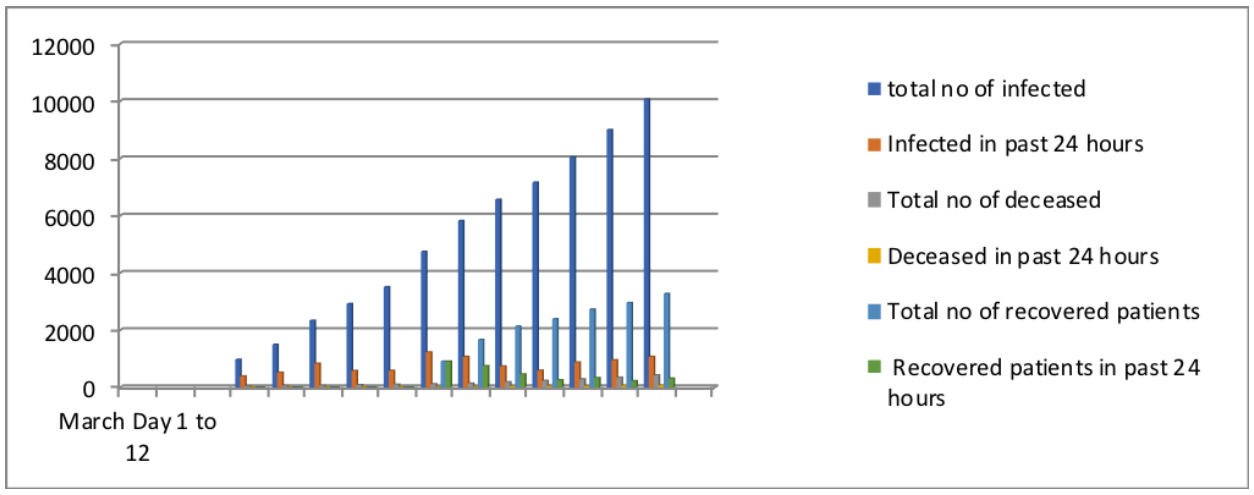
Table 1, 2 and 3 are showing COVID 19 data collection of diverse number of patients from 1 March to 1 April 2020 in Iran. Iran registered its initial case on 19 February 2020. Table 1, 2 and 3 showed that the total number of cases infected on March 1 was 978 which increased to 24,811 on 24 March, a total of 34 days. From 25th march to 1st April 2020, the overall number of active infections were 47,593 a figure nearly double in one week.

The infection has spread in all the31 provinces with Tehran, Mazandaran and Qom province are mostly affected as shown in the graph.

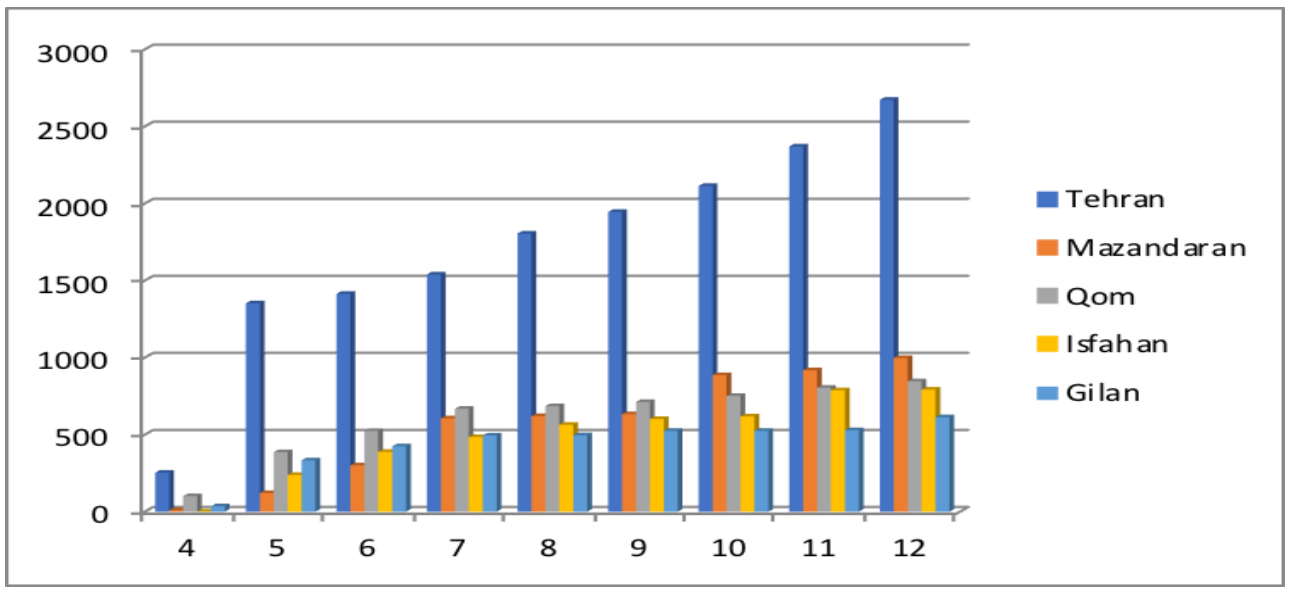


Graph 1: mortality rate of various age groups till 1 April 2020

Graph 1 shows the mortality rate of various age groups till 1 April 2020. According to this graph, a total number of 3,036 persons died. There are approximately 2,671 deaths of Old people,304 deaths of young individuals and 61 deaths of Children which consists of 88 %,10 % and 2 % respectively. Based on the research, I can assume that the average mortality rate in Iran would be around 4 % to 5 % but it could rise if COVID 19 infection is not effectively controlled. The mortality rate was initially estimated to 2 % by World health organization. On 3 March 2020, mortality rate was increased to 3.4 %. It can increase to furthermore depending on the spread of infections in different countries.



Graph 2: This graph shows us COVID 19 data collection of total count of patients from 1 March to 12 March 2020. According to this graph there are approximately10,075 of the total figures of infected patients in which 1075 infections are detected in the past 24 hours. Total number of deceased individuals up to 12 March 2020 are 429 while the number of deceased individuals in past 24 hours are 75. It is important to mention that about 3276 people have been recovered from infection while from 1st to 5th March no recovered persons are noted.



Graph 3: This graph shows the COVID 19 data collected in different Provinces of Iran from 4 March to 12 March 2020.From 4th march, the number of infected cases in Tehran, Mazandaran, Qom, Isfahan and Gilan province was 253,9,101,0 and 35 respectively which has increased in 9 days to 2673,997,846,792 and 613 respectively. The number of infected cases has increased in all five provinces particularly in the province of Tehran.

Discussion

It is a great challenge for Iran to typically control COVID 19. In the past, we have seen the impact of other epidemics such as severe acute respiratory syndrome [SARS] and Middle east respiratory syndrome [MERS] in some developed countries. Beyond Iran, COVID- 19 has been reported in 125 other countries such as China, Italy, South Korea, Spain, France, Germany, United States of America, Switzerland, Norway, and Japan etc. The outbreak raised several research questions such as its origin, pathogenesis, and treatment. There is currently no appropriate drug or effective vaccine. Chloroquine Sulphate and Anti-retroviral have been used on COVID-19 patients on trial basis. Some countries such as China, the United States of America, UK, Israel, and Iran claim to have been or nearly effective in vaccine development. The vaccine is incredibly difficult for large populations to manufacture in a shorter time frame **[13,14]**. It is easier to quarantine small cities with small population than larger cities with large population. Improved manpower and numerous facilities are fundamental for managing outbreaks in bigger cities and provinces. This large and complex outbreak of COVID 19 revealed problems in Iran's health care system. Such specific problems are lack of preparedness in potential emergency, prevention and control of diseases, lack of availability of test kits for accurate diagnosis of COVID 19, adequate masks and protective equipment. One major problem is the United States sanctions on Iran which normally include lifesaving drugs and diagnostic equipment **[13,15,16]**.

Some local and independent media outlets and local officials have tried to create panic by giving false information without providing substantial evidence. May be some of the cases have not been properly screened due to apparent lack of testing kits.

In my opinion, all the countries should help each other to contain COVID 19 outbreak. Information regarding COVID-19 should be shared on each platform.

In conclusion, to overcome such outbreak, Iran should improve its

health systems. Extensive testing is the main key to stop covid 19 infection chain. United States should lift sanctions on humanitarian grounds so that Iran could be able to contain COVID 19.WHO and other international aid agencies should cooperate with Iran to control the spread of Corona virus infection. Media and newspaper should also pay a role to educate the public about this disease. All countries affected with this epidemic should share their experience. General public should cooperate with the government to contain the disease. In the author best knowledge, this is the first study to approximate the number of Corona virus cases in different cities and provinces of Iran. God bless us all!

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